ORDER

6750.52

CATEGORY II/III INSTRUMENT LANDING SYSTEM (AN/GRN-27 REPLACEMENT) PROJECT IMPLEMENTATION PLAN

July 26, 1991

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Distribution: A-W(NC/NN/NW/SE/SM/LG/VN/AS)-3;A-W(FS/TR)-2; A-X(AF/LG/AT/FS/AS)-3; A-Z-1; A-Y(DE/AY)-3;A-FAF-2/7(LTD)

Initiated By: ANN-120

RECORD OF CHANGES

DIRECTIVE NO. 6750.52

CHANGE TO BASIC	SUPPLEMENT			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FOREWORD

This project implementation plan provides management direction for the replacement of existing National Airspace System Category II/III Instrument Landing Systems with new systems incorporating Remote Maintenance Monitoring. It defines the major functional responsibility levels, management direction, and overall program guidance to all responsible levels within the Federal Aviation Administration for the procurement and implementation of the instrument landing systems.

Gary N. Skillicorn
Program Manager for Landing

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CHAPTER 1. GENERAL

1. PURPOSE. This order provides technical guidance and direction for the implementation of Category II/III Instrument Landing Systems (CAT II/III ILS) with Remote Maintenance Monitoring (RMM) into the National Airspace System (NAS). It establishes program management, program implementation, and defines responsibilities governing the activities of organizations.

2. DISTRIBUTION. This order is distributed to branch level in the office of the Program Directors for Communications, Navigation and Landing, and Weather and Flight Service Systems; the NAS System Engineering, Systems Maintenance, and Logistics Services; Aviation Standards National Field Office, Office of Airport Standards; to division level in the Flight Standards and Air Traffic Plans and Requirements Services; to branch level in the regional Airway Facilities, Logistics, Airports, Air Traffic, and Flight Standards divisions; to director level at the FAA Technical Center; to branch level in the FAA Logistics Center and FAA Academy at the Mike Monroney Aeronautical Center; and limited distribution to the Airway Facilities (AF) General National Airspace System (GNAS) sectors, sector field offices, sector field units, and sector field office units.

3. DEFINITIONS. The following acronyms and abbreviations are used in this order:

AF	Airway Facilities
ARTCC	Air Route Traffic Control Center
ATCT	Air Traffic Control Tower
BIT	Built-in-test
CAI	Contractor Acceptance Testing
CAT II/III ILS	Category II/III Instrument Landing System
CCB	Configuration Control Board
CCD	Configuration Control Document
CDI	Course Deviation Indicator
CM	Configuration Management
CO	Contracting Officer
CRS	Contractor Repair Service
DCE	Data Communications Equipment
DME	Distance Measuring Equipment
DRR	Deployment Readiness Review
FAA	Federal Aviation Administration
FOB	Freight On Board
FRDF	Facility Reference Data File
FY	Fiscal Year
GBL	Government Bill of Lading
GFM	Government Furnished Materials
ICD	Interface Control Document
ILS	Instrument Landing System

ILSP	Integrated Logistics Support Plan
IRD	Interface Requirements Document
JAI	Joint Acceptance Inspection
LCU	Link Control Unit
LRU	Line Replaceable Unit
MDT	Maintenance Data Terminal
MPS	Maintenance Processor Subsystem
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
NAILS	NAS Integrated Logistics Support
NAILSMT	NAS Integrated Logistics Support Management Team
NAS	National Airspace System
NCP	NAS Change Proposal
NOTAM	Notice to Airmen
ORD	Operational Readiness Demonstration
PIP	Project Implementation Plan
PIR	Portable ILS Receiver
PMDT	Portable Maintenance Data Terminal
PSRB	Program/Project Status Review Board
QRO	Quality Reliability Officer
RF	Radiofrequency
RICE	Remote Indications and Control Equipment
RMM	Remote Maintenance Monitoring
RMS	Remote Monitoring Subsystem
T&E	Test and Evaluation
UHF	Ultra High Frequency
VHF	Very High Frequency

4. AUTHORITY TO CHANGE THIS ORDER. The Program Manager for Landing, ANN-200, will approve all changes to this order.

5.-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The CAT II/III ILS replacement project, authorized in Capital Investment Plan projects 44-20 and 44-21, consists of the procurement of ILS equipment as defined in specification FAA-E-2852, Category II/III Instrument Landing System, Equipment Requirements. The systems will replace the aging AN/GRN-27 (CIP 44-20) and Wilcox Mark II, Mark III, and AN/GRN-29 (CIP 44-21) systems currently fielded. (Some of the Wilcox Mark II systems are dual-channeled Mark 1F systems). New establishments may be procurred under contract options.

The procurement will be a firm fixed-price contract with two options. A total of 75 AN/GRN-27 replacement systems and 25 Wilcox Mark II, Mark III and AN/GRN-29 systems will be procured along with any new establishments.

a. Delivery by Fiscal Year (FY). Delivery of CAT II/III ILS with RMM are planned as follows:

(1) FY 94 - 36 systems

(2) FY 95 - 36 systems

(3) FY 96 - 3 systems + options

(4) FY 97 - Optional systems

b. Basic Equipment. The Category II/III ILS is comprised of the items listed in subparagraph b(1)-b(11):

Item No.	Description
(1)	VHF Capture Effect Localizer Subsystem
(2)	UHF Capture Effect Glide Slope Subsystem
(3)	VHF Marker Beacon Subsystem
(4)	Local Control Equipment
(5)	Remote Indication and Control Equipment
(6)	Localizer Far Field Monitor Subsystem
(7)	Remote Maintenance Monitor
(8)	Portable ILS Receiver
(9)	Documentation
(10)	Spares
(11)	Special Tools and Test Equipment Hardware

Three marker beacon systems will be provided as inner, middle, and outer markers. Wide aperture localizer antennas will be procured with all systems. The systems will contain embedded Remote Maintenance Subsystems (RMS) which comply with RMMS documentation (e.g. NAS-MD-790

RMM Interface Control Document, NAS-MD-793 RMMS Functional Requirements for RMS, and NAS-SS-1000 NAS System Specification, Vol. I, App. III and Vol. V). Funding will be provided to the regions for installation and checkout.

c. Replacement Facilities. This project includes special test equipment but not general purpose test equipment for replacement facilities. For replacement projects, regions should use as much of the existing test equipment as feasible. Existing shelter buildings, if in satisfactory condition, will be used for installation of procured equipment. Localizer, glide slope, and marker beacon shelters are not being procured under this contract. For damaged or unusable shelters or other special instances, funding for new shelters will be supplied by the Program Office on a case-by-case basis.

d. New Establishments. Any new establishments will receive all necessary special test equipment and funds to purchase and install shelters with the required lightning protection. Funding will be provided to the FAA Logistics Center for purchase of common test equipment. The project will provide regional funds for the establishment of new facilities.

21. PURPOSE. The purpose of this project is to procure and to install ILS equipment to replace existing equipment and provide instrument approach guidance on designated Category II/III runways.

22. HISTORY.

a. The present ILS population is comprised of several generations of equipment, none of which have RMM capability.

b. This project will provide at least 45 replacements starting with FY 93 funds and will include an option for up to 150 total systems over 7 years as requirements are established during the contract period of 1991 through 1997.

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The ILS consists of a localizer, glide slope, marker beacons and necessary monitor and control equipment. The localizer provides a course in the azimuthal plane, with one course directed along the center line of the runway toward the direction of the approaching aircraft. The localizer thus provides a course of lateral guidance of the aircraft by actuation of the course deviation instrument in the aircraft. The glide slope unit of the system transmits a signal pattern such as to produce a glide path along the approach course, (front only), defined by the localizer; thus providing vertical guidance to the pilot by actuation of the horizontal cross pointer instrument. The 75-MHz marker beacons provide "over-the-station" indications to the pilot through the operation of distinctive signal lights and audio tones to mark positions along the approach course. Figure 3-1 describes the placement of the CAT II/III system.

a. VHF Localizer. The VHF localizer subsystem will provide guidance in the horizontal plane to aircraft in approaches to, and landings at airfields. The radiation from the localizer antenna group will produce a composite field pattern that is amplitude modulated by a 90 Hz and a 150 Hz tone and 1020 Hz identification tone. Further detailed information of performance may be found in section 3 of the equipment specification (FAA-E-2852).

(1) VHF Localizer Station. A completely equipped VHF localizer subsystem will consist of the following:

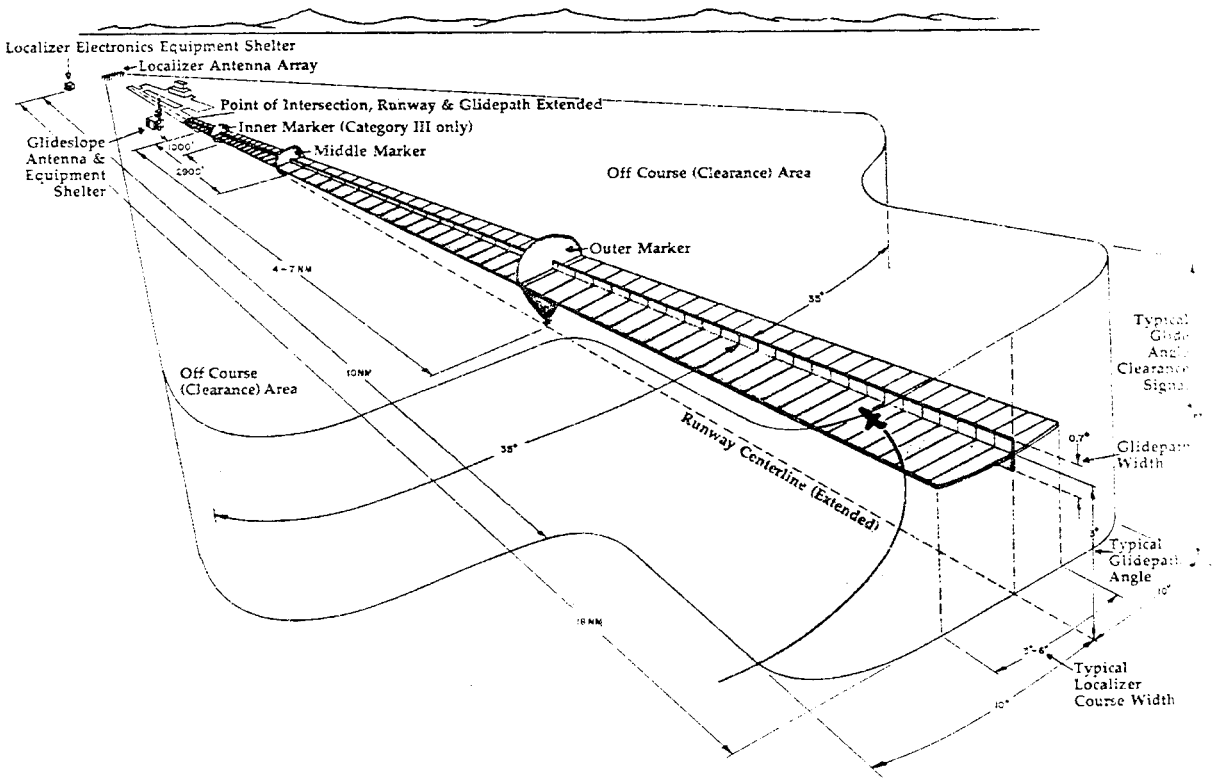
(a) Dual course and clearance transmitters with associated modulation, control, and automatic changeover equipment.

(b) Localizer antenna array with associated cabling, stripline or microstrip divider network or distribution units, integral monitor pickup devices and stripline or microstrip combining units, obstruction lights and antenna element support structures. The antenna is located about 1,000 feet from the rollout end of the runway facing the touchdown end of the runway that it serves. The building that houses the localizer lies to the side of the runway at a minimum distance of 250 feet from the runway centerline extended.

(c) Dual localizer monitor group.

(d) Far field monitor group.

FIGURE 3-1 CAT II/III ILS SYSTEM PLACEMENT



(2) Localizer Antenna Array. The antenna array will consist of several identical elements with appropriate spacing and excitation to produce the carrier and sideband patterns and clearance signal described in the equipment specification. The array will be broad banded and operate throughout the range of 108 to 112 MHz without adjustments. The array will operate as a two-frequency system and will have its own integral monitor system. The antenna system will be prefabricated and include radiating elements, radomes (if required), mounting bases and support posts, stripline or microstrip distribution network(s), in-line phasing detector(s), integral monitoring, stripline or microstrip monitor combining network(s) and detection system(s), interconnecting RF cables, obstruction lights and AC power cables. All interconnecting cables of a single antenna array will be fabricated from a single reel, or batch of cable, from a single run by the cable manufacturer. No attempt will be made to describe the specific radiation pattern characteristics since they are documented in great detail in the equipment specification and also meet the functional characteristics of the U.S. Standard Flight Inspection Manual, OA P 8200.1.

b. UHF Glide Slope. The UHF glide slope subsystem will provide guidance in the vertical plane to aircraft engaging in approaches to and landings at airfields. The radiation from the UHF glide slope antenna group will produce a composite field pattern that is amplitude modulated by 90 Hz and 150 Hz tones. The glide slope will be capable of an adjustment to produce glide path angles between two and four degrees. The pattern will be arranged to provide a straight line descent path in the vertical plane containing the runway centerline, with the 150 Hz tone predominating below the path and the 90 Hz tone predominating above the path, to at least an angle equal to 1.75 of the glide angle.

(1) UHF Glide Slope Subsystem. The basic glide slope subsystem will be a dual frequency design for use in a "capture effect" configuration. A complete capture effect UHF glide slope will consist of the following:

(a) Dual course and clearance transmitters with associated modulation, control, and automatic changeover equipment.

(b) One complete glide slope antenna group consisting of three identical directional transmitting antennas, including power divider networks, with integral monitoring probes and combining networks, associated cabling and a 60-foot tower consisting of a 20-foot base section, one 20-foot section, one 10-foot section and two 5-foot sections.

(c) Dual glide slope monitor group, including two clearance monitors and a clearance cancellation network for interface with the pickup loop monitor network.

(d) One amplitude and phase control unit.

c. Inner, Middle and Outer Markers. The inner, middle and outer marker functions are performed by 75 MHz transmitters with the appropriate antennas. The inner marker is located at the missed approached point. The middle marker is located approximately 3500 feet from the ILS runway threshold in line with the approach, while the outer marker lies along the same approach 4 to 7 miles from the ILS runway threshold.

(1) VHF Marker Beacon Station. A complete single equipment VHF marker beacon station consists of the following:

(a) One transmitter group with associated monitor and modulation equipment.

(b) One antenna group with monitor pickup device and associated cabling, divider networks, connectors, hardware, etc. that are necessary to connect the transmitter to the antenna array and to mount the antenna to the steel tower.

(c) One standby battery power group.

(d) Steel antenna support tower.

d. Local Control Equipment. The localizer and glide slope local control equipment provides local on/off control and status information of the transmitting equipment, automatic shutdown or transfer to standby transmitters in response to monitor actions, automatic station turn-on after power interruption, a time delay to prevent short transients from causing shutdown, and audio monitoring of the identification signal.

e. Remote Status Indication and Control Equipment. An ILS status control unit and an ILS status unit will be provided.

(1) ILS Status Control Unit. This unit, mounted in the tower equipment room, will provide control of and visual indication of the status of the localizer, glide slope, localizer far field monitor and the three marker beacon subsystems by the use of a green "normal" and red "alarm" (abnormal) indicator light for each facility. The alarm status indicator will respond to a status change instantaneously. The unit contains an aural alarm which operates simultaneously with the operation of the red "alarm" lights to indicate an abnormal condition of the localizer, glide slope, marker beacon subsystems or the spare

channels. A variable delay aural alarm will be activated in the case of localizer far field monitor alarm. Additional control and monitor circuits are included per FAA-E-2852.

(2) ILS Status Unit. This unit, mounted in the tower, will provide visual indication of the status of the localizer, glide slope, localizer far field monitor and the three marker beacon subsystems by the use of green "normal" and red "alarm" (abnormal) indicating lights slaved to the indicator lights of the ILS status control unit. The unit will include an aural alarm which operates simultaneously with the operation of the red "alarm" (abnormal) lights to indicate an abnormal condition of the localizer, glide slope, marker beacon subsystems or the spare channels. A variable delay aural alarm will be activated in the case of localizer far field monitor alarm. Other functions are provided according to FAA-E-2852.

(3) Control Lines. The remote status and control functions will be accomplished utilizing digital information over a single voice grade balanced telephone line pair (not furnished under this procurement) connecting the ILS status control unit to the localizer, the glide slope, the localizer far field monitor and each of the marker beacons. The status information will be generated from the individual monitored facility and the control information will be generated by the ILS status control unit.

f. Localizer Far Field Monitor Subsystem. The VHF localizer far field monitor subsystem will consist of the following:

(1) Three monitor antennas.

(2) Two far field monitor receivers.

(3) Two monitor units.

(4) Combining/time delay/control circuits.

(5) Far field monitor equipment cabinet.

(6) Battery shelter equipped with stand-by batteries.

(7) Interface cables.

g. Remote Maintenance Monitoring (RMM). The CAT II/III contract and specification to which the equipment is built, requires remote maintenance monitoring. Operational requirements for the RMM system are given in NAS-MD-792 and NAS-SS-1000 Vol. V. Functional requirements for the RMM system are given in NAS-MD-793. The RS-232 ports located on the localizer, glide slope, and marker beacon equipment cabinets will allow connection to a maintenance data

terminal (MDT). There will be one MDT furnished for this use for each system. All of the access to electronic adjustments will be through the use of the MDT with screens in English. The detailed RMM interface will be described in the CAT II/III ILS IRD and ICD.

(1) ILS Remote Maintenance Monitor. The ILS RMM consists of the various sensors, microcomputers, built-in-test equipment and microprocessor controlled equipment necessary to remotely monitor, control, record and certify proper operation of the subsystems comprising the ILS's. It includes a link control unit (LCU) and the RMS's. It will be designed and manufactured in accordance with the requirements of NAS-MD-793 and FAA-E-2852.

(2) Link Control Unit (LCU). The LCU provides a central point for communication between the maintenance processor subsystem (MPS) and the ILS RMS. It utilizes an LCU to RMS interface operating at a minimum of 2400 bits per second to manage communications to the ILS subsystem sites. The LCU will provide buffer action in collecting input data at various rates from the associated RMS's and will buffer the received data to a higher (up to 19,200 baud) rate onto a dedicated line to the MPS's. The LCU is connected to the subsystem RMS's via Government furnished point-to-point, half duplex, two-wire phone lines meeting minimum phone line quality of 3002 (AT&T Tariff, FCC-260) per Bell System Technical Reference Publication 41004. The LCU also stores data necessary for certifying ILS subsystem performance and when requested by the MPS forwards data to the MPS or acts upon commands from the MPS. The LCU will be provided with an MPS interface in accordance with EIA Standard RS-232, wired as synchronous data terminal equipment (DTE), four wire, full duplex, type D interface. The MPS interface will be wired to a rear panel mounted female MIL-C-24308 (MS-18275) connector on the LCU. The MPS interface data rate will automatically adjust to rates of 2400, 4800, 9600 and 19,200 bits per second. The LCU will also have a terminal interface. Communication will be in compliance with NAS-MD-790.

(3) Remote Monitoring Subsystems (RMS). The ILS subsystem RMS's, with the exception of the environmental sensors, are an integral part of the equipment at each of the ILS subsystem sites. The RMS's consist of the various embedded sensors required for sampling signals from the ILS equipment units, an interface unit (if required) to buffer or preprocess the sampled signals and a data acquisition system for digitizing, formatting and transmitting the processed signals to the LCU and or the MPS on a periodic or programmable basis or upon request. Each ILS subsystem RMS will incorporate a terminal interface. When an MDT is connected to the terminal interface at the subsystem RMS, a qualified, authorized operator will have the capability to accomplish the periodic routine maintenance tasks, the recording of site data, the performance of fault isolation and diagnostic testing, the control and adjustment of

subsystem equipment parameters and the certification of the individual ILS subsystem. Operational requirements for the RMS are given in NAS-MD-792 and NAS-SS-1000 Vol. V. Functional requirements for the RMS are given in NAS-MD-793.

h. Portable ILS Receiver. The Portable ILS Receiver (PIR) is a portable, battery operated receiver used in measuring signal characteristics of the ILS localizer and glide slope subsystems. The PIR consists of a basic receiver with separate antennas and accessories for operation with either glide slope or localizer signals. A PIR will be furnished with each ILS system provided in this procurement.

31. PHYSICAL DESCRIPTION. Equipment purchased for this project will be functionally equivalent to existing ILS equipment, but will probably be physically smaller due to more advanced construction techniques and higher level of integration.

a. VHF Localizer. The localizer equipment cabinet will have a cabinet type rack with top openings and easily removable covers for cable entrances. The localizer antenna array will be similar in construction to existing arrays, and will be capable of being mounted on an elevated support structure up to a height of 25 feet above ground.

b. UHF Glide Slope. The glide slope equipment will also have a cabinet type rack with top openings and easily removable covers for cable entrance. The antenna support will be a 60-foot self-supporting steel tower. The tower will contain a ladder and will be supplied with safety climbing equipment, obstruction lights and will include associated cables and connectors.

c. Marker Beacons. The marker beacon transmitter, monitor and battery charger/power supply will be housed in a cabinet designed to be mounted inside the marker beacon shelter. The cabinet will be vented as required for adequate convection cooling with RF screening as required to meet equipment performance requirements. The marker beacon antenna support will be a self-supporting steel tower.

d. ILS Status and Control Unit. The ILS status and control unit will be designed for mounting in a standard 19-inch relay rack. Panel height will not exceed 7 inches and the depth will not exceed 9 inches, excluding connectors.

e. ILS Status Unit. The ILS status unit will be a completely enclosed metal container designed either for desk top mounting or for installation within a rectangular cut-out in an operating console. Visual indicators will be of a sunlight readable type.

32. SYSTEM REQUIREMENTS.

a. Power Requirements.

(1) Primary Power. The localizer, glide slope, and marker beacon equipment will be designed to operate from a nominal 120/240, 60 Hz, three-wire, single-phase AC power source. Current requirements, while not specified, are expected to be less than 15 amperes for a complete station.

(2) Standby Power. The localizer, glide slope, and marker beacon stations will each contain a standby battery power system. The batteries will provide continuous normal operation of the ILS Status Control Unit and the ILS Status Unit for not less than one hour, the localizer and glide slope for not less than 4 hours, the localizer FFM for not less than 72 hours, and the marker beacon station for not less than one week. No-maintenance, non-liquid electrolyte, non-gassing batteries will be provided.

b. Modularity. The ILS design will make maximum use of easily removable plug-in module assemblies containing one or more related circuits.

c. Interchangeability. Due to the high degree of functional commonality between stations, various assemblies of the ILS will be designed to maximize module interchangeability.

d. Maintainability. The localizer, glide slope, and marker beacon stations will have a mean time to repair (MTTR) of 30 minutes or less and a maximum maintenance time of 45 minutes. The equipment will not require any manufacturer specified preventive maintenance beyond maintenance procedures directed in Order 6750.49, ILS Maintenance Handbook.

e. Reliability. The localizer and glide slope stations will each have a specified mean time between failure (MTBF) of not less than 4000 hours. Each marker beacon station and the Far Field Monitor will have a specified MTBF of not less than 10,000 hours. The Remote Indications and Control Equipment and PIR will have a specified MTBF of not less than 20,000 hours. The LCU will have a specified MTBF of not less than 35,000 hours.

33. INTERFACES.

a. MPS Interface. The CAT II/III ILS will interface with the MPS in accordance with NAS-MD-790, Remote Maintenance Monitoring System Interface Control Document.

b. MDT Interface. The CAT II/III ILS will interface with the MDT in accordance with NAS-IR-51045100, Maintenance Data Terminal (MDT) to Remote Monitoring Subsystem (RMS) Interface Requirements Document.

34.-39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. The procurement of the CAT II/III ILS equipment will provide systems for delivery starting with the first site in June 1993 and ending before September 1997. See appendix 1 for delivery schedule.

41. MILESTONE SUMMARY SCHEDULE. The current project schedule is shown in Table 4-1, Milestone Summary Schedule. Project events will be scheduled in relationship to the date of contract award. The dates listed are for anticipated milestones. This table is by no means an all inclusive list of project milestones necessary for project completion.

TABLE 4-1. MILESTONE SUMMARY SCHEDULE

EVENT	DATE
Contract Award	August 1991
Preliminary Design Review	March 1992
Critical Design Review	August 1992
First system delivered to Government at the T & E sites	April 1993
First production system delivered to operational site	9 Months after Government gives Production Approval (Note 1)
Last system delivered to operational site	24 Months After Government Approval (Initial buy) (Note 1) Options TBD
Note 1: Government approval is expected approximately 6 months after delivery to Government at the T&E sites.	

42. INTERDEPENDENCIES AND SEQUENCE. The following projects were identified as having interdependencies with the CAT II/III ILS project. Because of the broad variation in site requirements, discussion of specific effects of each program on a site-by-site basis is beyond the scope of this PIP.

a. The Airport Cable Loop Program. The Airport Cable Loop Program establishes a network of all the airport's power and control cables. The CAT II/III ILS projects may precede the Airport Cable Loop Program at some locations. The localizer and glide slope sites for this project will each require a single pair of voice grade lines to interface with the remote status and control unit located in ATCT equipment room. Fiber optic interfaces have not been well enough defined to include as part of the specification for equipment purchased for this project.

b. The Airport Telecommunications Program. The Airport Telecommunications Program will establish the specifications and criteria for a reliable and flexible distribution system for low activity and medium activity airports. It is related to all airport projects that require buried cable for control signals or communications between sites. The Airport Telecommunications Program investigates alternative communications media within the NAS, considering findings and recommendations of the Spectrum Engineering Division, ASM-500, with respect to radio frequency (RF) interference. The CAT II/III ILS impacts this program between the subsystems and the control facility.

c. Remote Maintenance Monitoring Program. Equipment purchased for this program will include RMM capability. An RMM ICD will be provided by the hardware contractor for use by the RMM program office (ANA-120) to develop a software interface for this new equipment within the MPS. Other applicable RMS related documents (e.g., test plans and procedures) will also be provided to ANA-120.

43.-49. RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT, GENERAL. This chapter describes the organizations within the Program Director, Navigation and Landing that are directly responsible for ILS project management.

a. Program Director for Navigation and Landing (ANN-1). The Program Director for Navigation and Landing manages, directs, and executes the FAA's engineering and management activities related to facilities design, air navigation, landing aids, and air traffic control facilities and equipment to ensure that the NAS is efficient, economical, and responsive to operational needs.

b. Program Management Engineering Division (ANN-100). This division is the principal element of the office responsible for the design, development, and implementation of systems, programs, and facility requirements for navigation and landing systems.

c. Associate Program Manager for Engineering (ANN-120). The associate program manager for engineering is the principal element of the division responsible for design, development, and implementation responsibilities for ILS's.

d. Program Manager for Landing Systems (ANN-200). The program manager has overall responsibility for the program and reports to ANN-1. The program manager is supported by a technical staff and is responsible for managing the design, development, and implementation activities associated with the ILS. These responsibilities include:

(1) Management. Planning, scheduling and managing the program from design through commissioning, logistics support, training, and program completion. Responsible for systems engineering, system design, man-machine interface, component design and related functional, technical, and performance characteristics. Acts as co-chair of the National Airspace Integrated Logistics Support Management Team (NAILSMT).

(2) Equipment and Spares Provisioning. Provides, in conjunction with the Logistics Service and Systems Maintenance Service, technical guidance to define logistics support for proper provisioning of equipment.

(3) Modernization Input. Developing service input for the modernization or in-service improvement of equipment.

(4) Technical Officer. Providing engineering advice and consultation to the contracting officer during procurement, serving as Contracting Officer's Technical Representative, and reviewing contractor requests and progress payments.

(5) Cost Data. Developing and providing cost data, controlling assigned funds, and adjusting program schedules and objectives as necessary.

(6) Technical Installation Instructions. Preparing technical installation instructions.

(7) Maintenance Instructions. Preparing maintenance instructions, identifying training, provisioning and test requirements, and directing the preparation of maintenance technical handbooks.

(8) Testing. Reviews and approves manufacturers' equipment test procedures. Establishes requirements and approves plans for test and evaluation of engineering activities of the FAA Technical Center.

(9) Inventory. Manages in-transit material for construction and installation. Maintains currency of material systems and control over equipment inventory.

(10) Installation. Management of installation activities for current and future systems to assure high level system performance.

(11) Acceptance. Providing research, engineering, development, design and systems analyses associated with acquisition and acceptance of hardware and software.

e. Associate Program Manager for Testing (ACD-330). The associate program manager for testing (APMT), will assume all testing responsibilities as contained in Order 1810.4A, ADL Test and Evaluation Program.

f. Associate Program Manager for Logistics (ANS-200). The associate program manager for logistics (APML) is responsible for ensuring all applicable NAILS element requirements are managed and integrated into all new NAS subsystems and equipments and facilities in a manner which provides for total life-cycle supportability.

g. Associate Program Manager for Contracting (ALG-310). The associate program manager for contracting (APMC) is a contracting officer with the authority to enter into, administer, or terminate contracts and make related determinations and findings to the program manager.

h. Associate Program Manager for Quality (ALG-420). The associate program manager for quality (APMQ) performs on-site, in-plant quality and reliability support (QRO) at contractors' and subcontractors' facilities and performance locations in support of the program manager.

51. PROJECT CONTACTS. This paragraph lists CAT II/III ILS project contacts and their addresses.

a. Program Director. Rod Gill, ANN-1, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C., 20591, FTS 267-6593, (202) 267-6593.

b. Engineering Manager. Reuben Powell, ANN-100, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C., 20591, FTS 267-6594, (202) 267-6594.

c. Program Manager for Landing Systems. Gary Skillicorn, ANN-200, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C., 20591, FTS 267-6675, (202) 267-6675.

d. Associate Program Manager for Landing. TBD, ANN-120, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C., 20591, FTS 267-6563, (202) 267-6563.

e. Project Engineer. William McPartland, ANN-120, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C., 20591, FTS 267-6554, (202) 267-6554.

52. PROJECT COORDINATION. The CAT II/III ILS project requires coordination with other services within the FAA and with regional representatives. Coordination by and with the following organizations is essential for them to accomplish their functions.

a. Maintenance Engineering Division (ASM-100). ASM-100 reviews procurement specifications to ensure the design meets the reliability and maintainability requirements and supports the general maintenance philosophy. ASM-100 also coordinates the development of an integrated logistic support plan for the CAT II/III ILS acquisition and develops maintenance standards and plans for implementation of maintenance concepts. Provides test equipment for new establishment projects.

b. Maintenance Operations Division (ASM-200). ASM-200 participates in the development and review of maintenance plans and develops the equipment maintenance requirements. In addition, ASM-200 develops national AF sector staffing standards for the CAT II/III ILS program and validates maintenance staffing requirements and personnel certification. The program manager ensures the project is in conformance with staffing, training, certification policies, guidelines, and requirements.

c. Telecommunications Management & Operations Division (ASM-300). ASM-300 provides the connectivity for the RMM data between the installed sites and their designated MPS.

d. Spectrum Engineering Division (ASM-500). ASM-500 obtains frequency authorizations necessary to satisfy the requirements of the NAS. This division also provides engineering support to regional and field facilities in the resolution of and prevention of RF interference to NAS facilities.

e. National Engineering Field Support Division (ASM-600). ASM-600 provides support in the development of test plans and procedures for site-specific requirements. ASM-600 will conduct Shakedown testing, analyze the results of the tests, and recommend actions needed to correct deficiencies.

f. NAS Support Division (ALG-200). ALG-200 develops, recommends, and issues agency systems, procedures, standards, and policies for material, supply, property management, and disposal. This division also develops the required logistics policies, plans, and standards required to support the national airspace integrated logistics support (NAILS) process.

g. Contracts Division (ALG-300). ALG-300 performs cost/price analyses of contractor's proposals and participates as a member of the Source Evaluation Board on CAT II/III ILS procurement subject to the contracting officer. In addition, ALG-300 provides procurement support for the ILS programs and plans, and places and administers contracts for the ILS equipment. ALG-300 also designates the APMC who is responsible for all contractual matters. The APMC is the only individual authorized to approve contract changes affecting price, delivery, or schedule.

h. Industrial Division (ALG-400). ALG-400 performs factory inspection of the CAT II/III ILS and assigns an APMQ at the time the contract is awarded. The APMQ is responsible for determining the number of QRO's required for the contract and for assigning them to the contractors' facilities. The QRO is the FAA's representative at the contractor's facility and is responsible for verifying quality control. The APMQ and QRO are directed by FAA policy and procedure, and by the terms and conditions of the contract.

i. Grants-in-Aid Division (APP-500). APP-500 directs the airport grant program and should be included in the coordination process to avoid conflicts that may arise because of pending airport project, including those where the airport may be purchasing its own ILS under the grant program.

j. FAA Logistics Center (AAC-400). AAC-400 manages the distribution of equipment for the ILS sites at the region's request. The FAA Logistics Center provides repair of unserviceable repairable items that require specialized repair procedures, test equipment/tools, diagnostic hardware/software, and major shop

facilities. It also provides all other FAA Logistics Center functions as set forth in the National Airspace Integrated Logistics Support (NAILS) Master Plan.

k. FAA Academy (AAC-900). AAC-900 evaluates and monitors the development and conduction of contractor training and provides maintenance training after completion of contractor training. AAC-900 will participate in workshops and meetings related to program implementation, NAILS and the Deployment Readiness Review (DRR) process.

l. Airway Facilities Training Program Division (AHT-400). AHT-400 analyzes training proposals prepared by ASM-200 and initiates action to meet training requirements.

m. Maintenance Automation Program (ANA-120). ANA-120 develops the interim monitoring and control software (IMCS) which interfaces the ILS RMS to the MPS.

n. Airborne Systems Technology Branch (ACD-330). ACD-330 provides the test director and conducts testing in accordance with FAA Order 1810.4A.

o. FAA Aviation Standards National Field Office. The FAA Aviation Standards National Field Office is responsible for providing the coordination to accomplish the following functions:

(1) Provides the support necessary for accomplishing the preliminary (preparatory) and commissioning flight inspections.

(2) Determines if the operational status of a facility or system is in accordance with the established tolerances.

(3) Certifies the facility or system for operational use in the NAS when all operational requirements have been met.

(4) When applicable, ensures that required Notices to Airmen (NOTAM) will be issued for any facility or system restriction.

p. Flight Standards Service Planning and Program Management Branch, AFS-12. AFS-12 manages the prioritization and validation of facilities and equipment requirements for ILS.

q. Surveillance and Weather Systems Branch, ACN-250. ACN-250 writes test procedures for and performs NAS Integration Testing.

r. FAA Regional Offices. The FAA regional offices through established administrative structures coordinate with all responsible parties to assure adequate funding, establish system

commissioning/service availability dates, assign project field representatives and determine utility availability for the CAT II/III ILS. The regions also provide field engineering as required to support preparations for the installation of the ILS system. Orders Government Furnished Materials (GFM), tools and test equipment to support installation and acceptance; tailor installation drawings to be site specific; initiate work orders and travel authorization; and assign field personnel. The region will purchase equipment shelters with lightning protection if required; funding is to be provided by headquarters on a case-by-case basis. Since there will be significant impact on air traffic operations during installation, testing and commissioning of the replacement system, the regional offices will be responsible for planning the shutdown of existing systems and the transfer of operations to other runways, removal and disposition (in conjunction with the FAA Logistics Center and the program office) of old equipment, restoral of service and commissioning, interlocking with opposite end ILS's, and (in conjunction with the contractor and the program office) procedures for handling radiated signals during installation and test. The following regional offices are responsible for the coordination required to accomplish the specified functions:

(1) Regional Airway Facilities Division (AXX-400).

(a) Installing facilities systems and equipment in accordance with established standards, specifications and instructions. The CAT II/III ILS Contractor will provide Installation Control Drawings under the contract. These will be reviewed by the program office and delivered to the regions in sufficient time to produce or procure site specific plans.

(b) Notifying the appropriate sector that a project has been funded and issuing a projected implementation schedule.

(c) Providing the sector an opportunity to review and participate in project plans during the engineering phase and for furnishing the sector a copy of the engineering plans and contract documents.

(d) Providing the sector a copy of the project work order at least 10 days before the start of project work.

(e) Providing the appropriate facility reference data file (FRDF) information to the sector for inclusion in the FRDF.

(f) Providing the essential facility, system, and equipment technical reference and performance parameters as part of the project transmittal when maintenance technical handbook parameters are not available.

(g) Ensuring that modifications, configuration control documents (CCD), manufacturer's field changes and factory changes are current and documented for equipment received from sources outside the Airway Facilities Sector.

(h) Notifying the joint acceptance board chairman of when the facility will be ready for Joint Acceptance Inspection (JAI), providing the sector all data necessary to prepare warranty failure reports on items failing prior to JAI, and providing regional Airway Facilities Division representatives for participation in the JAI.

(i) Establishing and maintaining a follow-up file for monitoring and clearing all JAI report exceptions, reviewing all JAI reports and follow-up reports for correctness, completeness and proper distribution, taking appropriate and timely actions to clear JAI report exceptions, and identifying additional sources of funds or initiating budgetary action, as necessary, to clear exceptions.

(j) Establishing in conjunction with flight standard procedures personnel, a realistic commissioning chart date, flight inspection, and any corresponding NOTAM.

(k) Notifying the regional Airports Division of the intent to establish an ILS at an airport and to coordinate with the division to avoid any conflict with actual or proposed airport development at that airport.

(2) Airway Facilities Sector.

(a) Reviewing contract documents and engineering plans during the engineering phase and providing comments to the regional Airway Facilities Division.

(b) Providing personnel as required at appropriate times throughout the project to witness and/or participate in construction, installation, tune-up, tests, and collection of technical reference data.

(c) Coordinating the release of equipment currently in use to regional Airway Facilities Division establishment personnel for use in the project.

(d) Properly maintaining those components of an existing facility that are unaffected by an improvement project.

(e) Ensuring that modifications/CCD's and documentation are current on installed equipment for the purpose for which the equipment was being used prior to the project.

(f) Providing a representative to serve as the joint acceptance board chairperson and other qualified personnel for participation in the JAI, preparing and distributing the JAI report, and assuming maintenance responsibilities and custodianship for facilities, systems, or equipment at the conclusion of JAI.

(g) Coordinating and follow-up on exceptions after the JAI to include exceptions assigned to other organizations or to a contractor for clearance, clearing exceptions that have been assigned to the sector, reporting the clearance of exceptions, and reviewing all waived exceptions to determine if actions will impact sector operations or other organizations.

(h) Maintaining all equipment warranty information and reporting equipment failing under warranty.

(i) Receiving, storing, and shipping project materials and disposing of excess equipment and materials.

(j) Participate in all phases of commissioning and initiate the official notification of commissioning.

(k) Early-on logistics coordination for regionally processed site preparation contracts as needed.

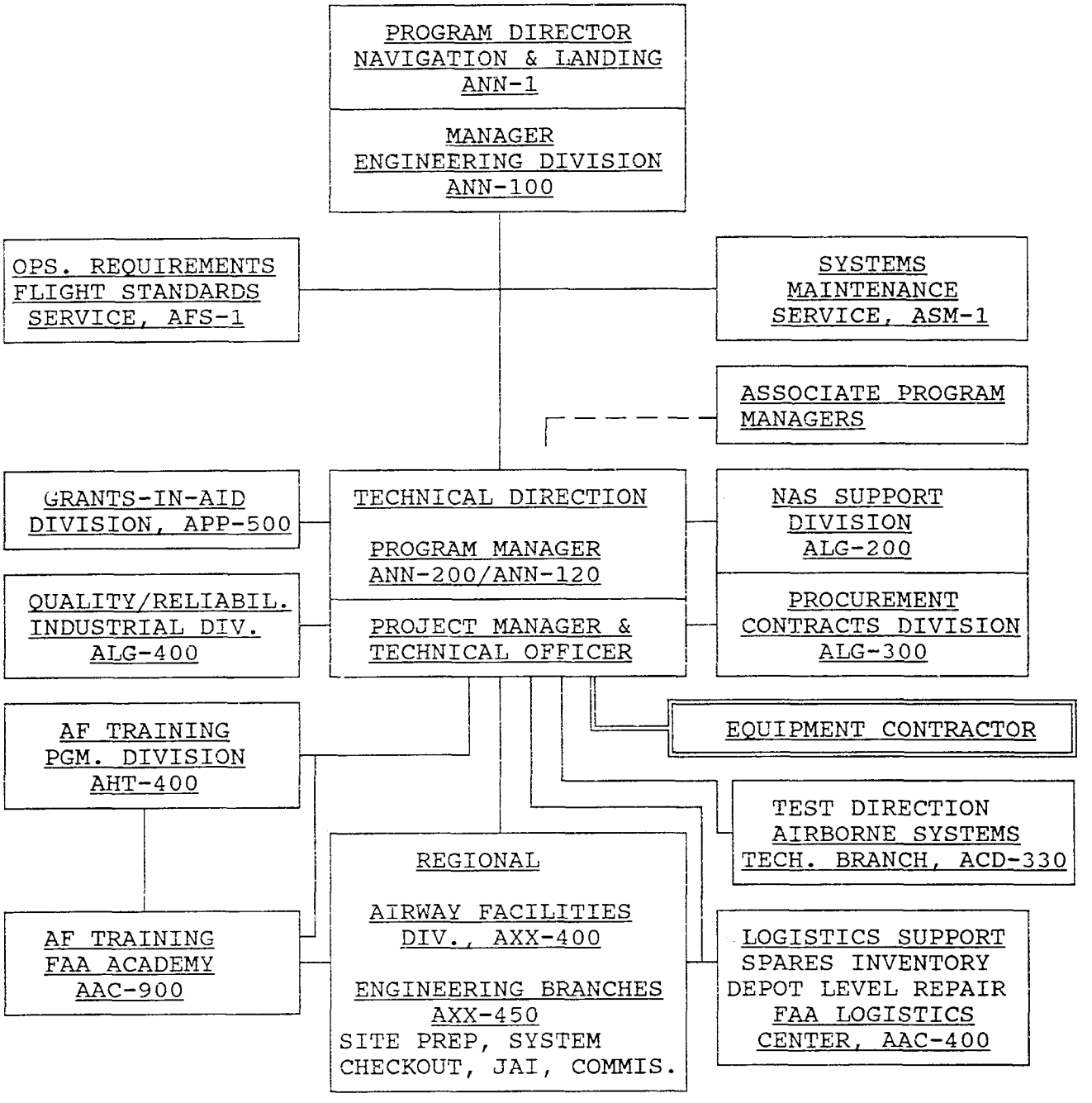
(3) Regional Logistics Division (AXX-50). Perform normal functional roles of material management, contracting, and real estate management as they relate to project implementation at the regional level. Provide representatives to participate in specific projects that the regional Airway Facilities division has identified as having major logistical problems and has requested the participation by the regional Logistics Division.

(4) Regional Flight Standards Division (AXX-200). Provide technical expertise to the regional Airway Facilities, as required, for accomplishing JAI's and the commissioning of facilities and systems.

s. Hardware Contractor. The contractor, when requested by ANN-120, provides engineering support services for onsite advice, including technical supervision to FAA technicians and the installation contractor concerning proper installation or operation of CAT II/III ILS.

53. PROJECT RESPONSIBILITY MATRIX. Figure 5-1 illustrates the FAA organizations responsible for the implementation of each significant function of the CAT II/III ILS project.

FIGURE 5-1 PROJECT RESPONSIBILITY



54. PROJECT MANAGERIAL COMMUNICATIONS. The CAT II/III ILS program manager within ANN is the focal point for all internal project communication. Organizations supporting the project designate a representative to maintain close communication with the ILS program office. Supporting organizations maintain communications within the FAA but never directly with the contractor without the contracting officer's permission. The meetings listed in subparagraphs 54a and 54b are the regularly scheduled project meetings, or conferences.

a. The National Airspace Integrated Logistics Support Management Team (NAILSMT) Meetings. NAILSMT meetings are held to ensure there is an interrelated, unified and iterative approach to the managerial and technical activities that support the NAS. During these meeting issues affecting logistics management, maintenance planning, supply support, test and support equipment, manpower and training support, support facilities, technical data, and packing, handling storage and transportation are discussed and resolved. These meetings are held as required, but not less frequently than annually, and may meet at the FAA headquarters, the FAA Logistics Center, or the contractor's facility. Additional guidance is contained in the FAA NAILS Master Plan and Order 4560.1B, Policies and Procedures Covering the Provisioning Process during the Acquisition of FAA Material, and Order 1800.58, NAILS Policy.

b. Program/Project Status Review Boards (PSRB). PSRB meetings are held monthly at the FAA headquarters to discuss project status and to resolve problems and issues affecting all phases of the project from the time the requirements are established until system deployment has been completed.

55. IMPLEMENTATION STAFFING. There are no personnel requirements peculiar to the implementation phase of the project.

56. PLANNING AND REPORTS.

a. Planning. For project planning purposes each region should provide the ILS program office with the following:

(1) A prioritized list of ILS locations for replacement, keeping in mind that replacements will have RMM capability. The regional lists will be combined to develop the prioritized replacement delivery schedule for the project.

b. Reports. No reports are required for this project.

57. APPLICABLE DOCUMENTS. Within this PIP the following documents are applicable.

a. FAA-G-2100e, Electronic Equipment, General Requirements, March 11, 1987.

b. Order 1800.8E, NAS Configuration Management, July 11, 1985.

c. Order 1810.4A, ADL Test and Evaluation Program, December 30, 1987.

d. Order 3400.3E, Airway Facilities Maintenance Certification Program, August 4, 1978.

e. Order 4560.1B, Policies and Procedures Covering the Provisioning Process During the Acquisition of FAA Material, March 10, 1989.

f. Order 6000.15A, General Maintenance Handbook for Airway Facilities October 26,1988.

g. Order 6000.26A, Reliability and Maintainability Policy, May 14, 1982.

h. Order 6030.45, Facility Reference Data File, March 28, 1974.

i. Order 6750.49, Maintenance of Instrument Landing Systems (ILS) Facilities, April 10,1989.

j. Order 6950.2C, Electrical Power Policy Implementation National Airspace System Facilities, November 1987.

k. FAA-STD-019a, Lightning Protection Grounding, Bonding and Shielding Requirements for Facilities.

l. NAS-DD-1000B, Level I Design Document, May 1986.

m. NAS-MD-110, Test and Evaluation (T&E) Terms and Definitions for the National Airspace System, March 27, 1987.

n. NAS-MD-790, Remote Maintenance Monitoring Interface Control Document.

o. FAA National Airspace Integrated Logistic Support (NAILS) Master Plan, March 1987.

p. FAA-E-2852, Specification, Category II/III Instrument Landing System, Equipment Requirements, March 23, 1989 (2 NAS Change Proposals (NCP) are pending).

q. NAS-SS-1000, NAS System Specification, Vol. I-App. III, and Vol. V.

r. Order 6000.30A, Policy for Maintenance of the National Airspace System.

s. NAS-MD-792, Operational Requirements for the Remote Maintenance Monitoring System.

t. NAS-MD-793, Remote Maintenance Monitoring System Functional Requirements for Remote Monitoring Subsystem.

u. FAA-E-2852, Specification for Category II/III Instrument Landing System (plus amendments).

v. OA P 8200.1, United States Standard Flight Inspection Manual.

w. Bell System Technical Reference Publication 41004.

x. MIL-C-24308, General Specification for Connector - Electric, Rectangular, Miniature, Polarized, Shell, Rack and Panel.

y. Order 1800.58A, National Airspace Integrated Logistics Support Policy.

z. Action Notice 1800.13, Realignment of National Airspace Integrated Logistics Support Functional Responsibility.

aa. WA 6090.1, Development and Implementation of Remote Monitoring Subsystems (RMS) Within the National Airspace System (NAS), June 6, 1988.

58.-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. Funding for this project is supplied under Capital Investment Plan programs 44-20 and 44-21. Headquarters will procure the systems and provide funding to the regions for installation. Fiscal year budget allocations are by nature dynamic and as such are not included in this order. The Program Manager, ANN-200, can supply current information if required.

61.-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. Deployment of CAT II/III ILS's is administered by the program manager and staff. The first systems will be shipped to the FAA Technical Center and to Tamiami, FL, the Test and Evaluation (T&E) sites, for operational testing. After completion of integration/shakedown testing and a successful Deployment Readiness Review (DRR) and DRR Excom meeting, systems will be tested at the contractor's plant and shipped at FAA expense to each designated site by Government Bill of Lading (GBL). The GBL will include provisions for unloading and the region should make preparations to provide storage (if necessary). The CAT II/III ILS will be shipped as an entire system to the site or storage facility where it will await installation. Installation of the equipment is the responsibility of the region. Table 7-1 depicts the DRR schedule.

TABLE 7-1. CAT II/III ILS DRR SCHEDULE

EVENT	DATE
Delivery to Government at T&E Sites	Apr 1993
Shakedown Testing Complete	Sep 1993
Final Report to Associate Administrator	Oct 1993
Excom Meeting and Production Approval	Oct 1993

71. SITE PREPARATION. The regions are responsible for preparing the sites where CAT II/III ILS equipment will be installed. Since most of the systems are replacement systems, the site preparations are projected to be minimal. Site preparation includes planning for installation and integration with other interrelated subsystems. Considerations for site preparation include weather conditions and concurrent construction activities.

72. DELIVERY. ILS equipment will be direct shipped to the sites. Crystals for the designated frequencies (if required) will be included in the delivery if the site forwards a written request containing all pertinent information to the program office. Projected delivery dates are contained in Chapter 4 with the last possible delivery scheduled for February 1998.

Implementation of the project is scheduled to be completed in 1998.

73. INSTALLATION PLAN. The FAA regions will coordinate the receipt, installation, and evaluation of all equipment required to form the CAT II/III ILS. The ILS will be installed in accordance with installation drawings prepared by the regions from Installation Control Documents provided by the contractor. The regional office will coordinate the complete installation, alignment, and operational tests on all identified ILS interfaces to assure full compliance with FAA specifications and performance. If required, the contractor will be available to provide engineering support services for onsite advice, including technical supervision to FAA technicians and the installation contractors.

74. CONFIGURATION MANAGEMENT PLAN. Configuration management is the process used to identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics, and record and report change processing and implementation status. The configuration management discipline will be applied to all configuration items included in the CAT II/III ILS baseline to ensure compatibility between elements within the ILS. All additions and changes to the CAT II/III ILS baseline will be proposed in a case file, and will be reviewed for recommended approval or disapproval by a Configuration Control Board (CCB). All changes to the NAS site design baseline must be processed and approved by the Navigation and Landing (ANN-100) CCB.

a. Acquisition Phase Configuration Management.

(1) The Navigation and Landing CCB controls the establishment of and changes to the CAT II/III ILS hardware baseline during the acquisition phase. For CAT II/III ILS matters, the CCB will include members from ANN-120, ASM-600, ASM-500, ASM-200, ASM-100, ASE-300, ASE-500, ACN-200, ACD-330, AVN-500, ANS-100, AAC-400, AAS-100, AFS-400, ALG-300, ALG-400, ANC-1, AOV-100, ATR-100, SEI, and the Configuration Management Division, ASE-620. The CCB is responsible for ensuring that the functional, performance, and interface requirements allocated to the CAT II/III ILS hardware subsystems are reflected in the baseline, and in any changes to those baselined, until product acceptance. The CCB is also responsible for ensuring that baseline documentation is accurate and reflects CAT II/III ILS operational requirements. Baseline documentation includes specifications and ICD's. The CCB retains this configuration amanagement responsibility until the hardware installation is commissioned at each site.

(2) The baselining of CAT II/III ILS hardware products occurs upon successful completion of the configuration audits. Hardware product acceptance is based on successful operational readiness demonstration (ORD) of the complete ILS.

(3) At contract completion, the change control functions and CCB records associated with hardware products that affect Level III drawings and instruction books transition from the Navigation and Landing CCB to the Maintenance Engineering (ASM-100) CCB.

b. Operational Support Phase Configuration Management.

(1) During the operational support phase, and for the entire life cycle of the implemented hardware enhancements, configuration management functions will consist of maintenance and change control management of site as well as product baseline (Level III Design).

(2) The ASM-100 CCB assumes baseline and change control management of all CAT II/III ILS installations as they are commissioned for operational service and of related NAS site design baseline (including logistics and training). The ASM-100 CCB is responsible for change control management of the CAT II/III ILS hardware product baseline. Hardware product baselines are maintained by National Airway Engineering Field Support Division (ASM-600) personnel for the field. The contractor will provide all engineering changes to ASM-600 when the changes are released and prior to implementation in the field. ASM-600 will evaluate the changes and approve the change for field implementation via the NCP process. The configuration management functions assigned to the ASM-100 CCB are described in the ASM-100 CCB charter.

75. DISPOSAL. The first five systems to be replaced will be checked over and any boards needed for interim maintenance of the remaining AN/GRN-27 systems will be salvaged and returned to the FAA Logistics Center. The remainder of the equipment from those systems and the remaining systems will be destroyed under the FAA Special Disposition Authority granted by the General Services Administration. Destruction will be performed by the pertinent region, with any salvaged assets (scrap metal, precious metal, etc.) accounted for. Under no circumstances are operational systems or components which could be used for or interfere with legitimate ILS operations to be left undestroyed.

76.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. FACTORY VERIFICATION. The CAT II/III ILS contractor will perform design qualification, type tests, and production tests using a complete ILS to validate and demonstrate that the requirements of specification FAA-E-2852 and the contract are met. These tests will verify that all hardware, software, and performance requirements are met before the FAA accepts a system from the contractor.

81. CHECKOUT. After installation of equipment by the regions, FAA personnel will conduct checkout tests in accordance with the procedure contained in the contractor developed equipment instruction books. The procedures followed will include testing of electrical and mechanical hardware interfaces, verifying system performance, testing of interfaces with diagnostics and verifying maintenance capability and the adequacy of support hardware and software.

82. CONTRACTOR INTEGRATION TESTING. Not applicable.

83. CONTRACTOR ACCEPTANCE INSPECTION (CAI). The activites to be performed for CAI will be included in the contractor-provided Master Test Plan, and will be implemented during the checkout activities as described in paragraph 81.

84. FAA INTEGRATION TESTING. These tests, conducted by ACN-250, verify that the CAT II/III ILS has been integrated as specified and that it can interface with the specified external systems. Included are tests that verify the operation of multiple interfaces and integration with other systems in the operational environment, such as:

a. Specifically testing NAS-SS-1000, Volume I (including Appendix III) and Volumes II through V subsystem level requirements as identified in the project's Master Test Plan Verification Requirements Traceability Matrix to verify NAS compliance.

b. Integration testing between the existing NAS and the new subsystem, while reverifying top-level functional requirements, while also establishing baseline operational performance values.

c. The operational effectiveness and suitability of the new subsystem in the NAS environment.

d. Testing of the interface between the system RMS and the remainder of the RMMS network, especially the RMS/MPS interface.

Testing will be conducted with the participation of user organizations. At the completion of integration testing the CAT II/III ILS should be adapted to parameters of the operational equipment with which it must interface.

85. SHAKEDOWN AND CHANGEOVER.

a. System shakedown is the critical period of testing that will be performed at the CAT II/III ILS T&E sites and at the first operational site to determine that it is ready for full operation as part of the NAS. System shakedown permits facility personnel to become familiar with the system, learn its limitations, and to become proficient in diagnosing problems and effecting repairs. ASM-600 is responsible for all shakedown testing. After the initial system shakedown testing at the test sites, ASM-600 will recommend to the DRR Board whether or not to commence production. After final shakedown testing at the first operational site, ASM-600 will recommend for or against additional deployment. Joint Acceptance Inspection (JAI) activities can be performed at field sites.

b. System shakedown activities include accomplishment of the following activities:

(1) Operational and maintenance proficiency and hands-on training.

(2) Evaluations to determine the adequacy of system failure detection and recovery procedures.

(3) Live testing of operational functions, including specific adaptation data, and system configuration.

(4) Evaluations to determine the suitability of displayed operational data, and establish any additional display requirements.

86. JOINT ACCEPTANCE INSPECTION.

a. A JAI is conducted in accordance with Order 6030.45, Facility Reference Data File, to gain the consensus of involved offices that the CAT II/III ILS project has been completed in accordance with applicable standards and specifications and that the facilities are capable of providing the services required within established standards and tolerances. After the successful completion of JAI and commissioning, the local AF technical representative assumes responsibility.

b. The JAI ensures compliance with requirements in the following areas:

(1) Facility construction and equipment installation.

(2) Facility/system/equipment performance.

(3) Facility technical performance documentation and maintenance reference data.

(4) Trained technicians.

(5) Facility logistics support.

(6) Final acceptance and commissioning.

87.-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT. The FAA is responsible for onsite and depot-level maintenance of CAT II/III ILS equipment procured.

a. Site Maintenance. Site maintenance technicians (either FAA and/or contractor) will perform periodic maintenance, replace CAT II/III ILS components down to the line replaceable units (LRU) and may perform limited repair/corrective maintenance functions onsite.

b. FAA Logistics Center Maintenance. FAA Logistics Center maintenance will consist of receipt and repair/replacement of failed LRU's. For repair and testing of these units, a "hot" test-bed will be required by the FAA and/or a commercial contractor.

c. Maintenance Plan. The Maintenance Plan for CAT II/III ILS will be contained in the Integrated Logistics Support Plan that will be published in accordance with Order 1800.58A, NAILS Policy. The ILSP is a NAS Integrated Logistic Support document.

d. Remote Maintenance. The RMS embedded in the CAT II/III ILS will monitor all environmental and system parameters and provide alarms via the MPS and the RICE if those parameters are beyond defined limits. The RMS also provides for calibration, diagnostics and fault isolation to the LRU remotely via the MPS. Security procedures are built-in to prevent unauthorized access to controls and data.

91. TRAINING. The training program for the CAT II/III ILS is contained in the CAT II/III ILS Subsystem Training Plan. Assignment of training quotas for the regions will be made by ASM-260 for AF personnel. The projected training requirements by individual work centers/facilities and principal training milestones will be included in the training plan. Initial training of FAA AF personnel will be conducted by the contractor at the contractor's facility. The contractor will provide a maintenance training program for the CAT II/III ILS in accordance with FAA-STD-028A, Contract Training Programs. Training course graduates will be able to configure the ILS for normal operation and system testing using manufacturers instructions and FAA Handbook Specifications. They will possess sufficient knowledge to troubleshoot and repair to LRU level and to perform and document FAA required periodic maintenance. A single engineering level course will be taught by the hardware contractor for purposes of training FAA Logistics Center personnel in component level repair, and engineering personnel who may have to make modifications to equipment in the future.

92. SUPPORT TOOLS AND TEST EQUIPMENT. All supply support and spare parts-peculiar will be stored at the FAA Logistics Center. Test equipment is supported at the AF Sector Office having responsibility for the ILS facility.

a. The contractor will provide a list of the common tools, test/support equipment, interface devices and connectors required for maintaining CAT II/III ILS equipment at all levels of maintenance. Procurement of common equipment not currently available to the site will be according to standard procedures (PSR, etc.).

b. The contractor shall identify special tools, test/ support equipment, and special interface devices required to support the CAT II/III ILS. The FAA will determine whether it is necessary to purchase any of the identified items. Those items identified will be provided by the contractor at system delivery.

93. SUPPLY SUPPORT. The FAA Logistics Center is responsible for providing supply support to the CAT II/III ILS in the area of procurement and storage and transportation of component parts (both common and LRU's). This responsibility also encompasses maintaining inventory records including the master FAA Catalog, and interfacing with the Federal Cataloging System.

94. VENDOR DATA AND TECHNICAL MANUALS. The contractor shall provide instruction books for the CAT II/III ILS in camera-ready form. The FAA will review, approve, and print the books for distribution. Two complete sets of instruction books will be provided with each ILS. Other technical data to be provided by the contractor includes: reliability and maintainability documentation, test procedures, provisioning technical documentation, and engineering/reprocurement drawings.

95. DISPOSAL OF EXCESS EQUIPMENT. The equipment that is replaced will either be returned to the FAA Logistics Center for canibalization during the changeout period or disposed of as discussed in paragraph 75.

96. FACILITIES. Not applicable.

97. EQUIPMENT NOT FURNISHED. The following is a list of equipments that may be required for a CAT II/III ILS but are not furnished by this project:

a. Equipment shelters with lightning protection.

b. Cabling from localizer and glide slope stations to the ATCT equipment room and ATCT control cab.

c. Test equipment.

d. Coaxial cabling to localizer and glide slope antenna.

e. Detector cables to localizer antenna.

f. Antenna mounts (both ground level and elevated).

All of the aforementioned will be required at present as well as new establishments. If the existing resources at present locations are not adequate, the regions will be able to use the standard procedures (PSR, etc.) for ordering project material from the FAA Logistics Center.

98. PERSONNEL CERTIFICATION.

a. Personnel maintaining this equipment will require certification in accordance with Order 3400.3E, Airway Facilities Maintenance Certification Program.

b. Implementation of the CAT II/III ILS will require issuance of interim personnel certification until a mandatory date has been issued.

99. EQUIPMENT CERTIFICATION. Equipment certification for the CAT II/III ILS will be in accordance with Orders 6750.49, Maintenance of Instrument Landing Systems (ILS) Facilities, and 6000.15A, General Maintenance Handbook for Airway Facilities.

APPENDIX 1. SYSTEM DELIVERY

1. PRODUCTION MODEL DELIVERY. The contractor will deliver five Production Model ILS's no later than 19 months after contract award. One system will be used as a configuration model. One system will be used for training. One system will be delivered to the program office T&E site (Tamiami, FL). One system will be delivered to the FAA Technical Center for integration and shakedown testing. One system will be used as a spare. The contractor may refurbish, test and deliver any of these systems at the end of the contract as production systems. RMM in this delivery will include a PMDT complete with software for each system.

2. PRODUCTION DELIVERIES.

a. The contractor will deliver all production ILS equipment to the locations in Figure 1, F.O.B. origin. The order of the locations is subject to change.

b. The Government will install the equipment at each designated site.

3. DELIVERY OF OPTIONAL ILS SYSTEMS. The contractor will deliver optional ILS's F.O.B. origin beginning 9 months after Government approval to begin production and at a rate of three (3) systems per month.

Figure 1 - Delivery Sites

Location	Runway	Estimated On-line date
FAA Academy (AAC-943) Oklahoma City, OK	-	1st Article
FAA Logistics Center (AAC-445) Oklahoma City, OK	-	1st Article
ILS Equipment, Tamiami FL	-	1st Article
FAA Technical Center, NJ	-	1st Article
FY1990 Systems		
San Francisco, CA (GWQ)	28R	3/95
Tulsa, OK (TUL)	35R	3/95
Atlanta, GA (ATL)	08R	4/95
Atlanta, GA (FUN)	09R	4/95
Atlanta, GA (HFW)	08L	4/95
Chicago O'Hare, IL (OHA)	14L	5/95
Chicago O'Hare, IL (RVG)	32L	5/95
Chicago O'Hare, IL (TSL)	27L	6/95
Chicago O'Hare, IL (IAC)	27R	6/95
Tampa, FL (AMP)	36L	7/95
Salt Lake City, UT (SLC)	34L	7/95
Covington, KY (CVG)	36	7/95
FY1991 Systems		
Dallas/Ft. Worth, TX (CIX)	18L	8/95
Dallas/Ft. Worth, TX (JHZ)	17R	8/95
Dallas/Ft. Worth, TX (FLQ)	17L	8/95
Dallas/Ft. Worth, TX (PKQ)	35R	9/95
Dallas/Ft. Worth, TX (RRA)	31R	9/95
Dallas/Ft. Worth, TX (VYN)	18R	9/95
Wichita, KS (TWI)	01L	10/95
Sacramento, CA (SMF)	16R	10/95
Spokane, WA (GEG)	21	10/95
Las Vegas, NV (LAS)	25	11/95
Anchorage, AK (ANC)	06R	11/95
Jackson, MS (JAN)	15L	11/95
Bangor, ME (JVH)	15	12/95
Boston, MA (BOS)	04R	12/95
Nashville, TN (BNA)	02L	12/95
Moisant, LA (MSY)	10	1/96
Seattle, WA (SZI)	16R	1/96
Minneapolis, MN (MSP)	29L	1/96

Location	Runway	Estimated On-line date

FY1992 Systems

Pittsburgh, PA (LXB)	10L	2/96
Cleveland, OH (CLE)	05R	2/96
Richmond, VA (BNE)	33	2/96
Milwaukee, WI (MKE)	01L	3/96
Windsor Locks, CT (BDL)	06	3/96
Augusta, GA (AGS)	35	3/96
Jacksonville, FL (JAX)	07	4/96
Charlotte, NC (DQG)	36L	4/96
Chattanooga, TN (CHA)	20	4/96
Shreveport, LA (SHV)	14	5/96
San Antonio, TX (ANT)	12R	5/96
Los Angeles, CA (LAX)	25L	5/96
FAA Academy, OK	-	6/96
Omaha, NE (OMA)	14R	6/96
Andrews, MD (RWS)	01L	6/96
Indianapolis, IN (IND)	04L	7/96
Detroit Metro, MI (HUU)	03R	7/96
Dayton, OH (ATD)	06L	7/96
Birmingham, AL (BHM)	05	8/96
Orlando, FL (OJP)	36R	8/96
Louisville, KY (SDF)	01	8/96
Knoxville, TN (BUI)	23R	9/96
Memphis, TN (OHN)	36L	9/96
Oakland, CA (INB)	29	9/96
Ontario, CA (TWO)	26L	10/96
Buffalo, NY (BUF)	23	10/96
Rochester, NY (MCU)	04	10/96
Providence, RI (PVD)	05R	11/96
Portland, OR (PDX)	10R	11/96
Huntsville, AL (HSV)	18R	11/96

Unfunded FY1991 Systems

Philadelphia, PA (PHL)	09R	12/96
La Guardia, NY (URD)	22	12/96
Baltimore-Washington (BAL)	10	12/96
Jamaica (Kennedy), NY (TLK)	13L	1/97
Fairbanks, AK (CNA)	01L	1/97
St. Louis, MO (SJW)	30R	1/97
Washington, DC (DCA)	36	2/97
Andrews, MD (MXK)	19R	2/97
FAA Logistics Center, OK	-	2/97

Future Requirements

Location	Runway	Estimated On-line date

Charleston, SC (CCI)	15	3/97
Charleston, SC (CHS)	33	3/97
Columbia, SC (CAE)	11	3/97
Tri-City, TN (TRI)	23	4/97
Greer, SC (GSP)	03	4/97
Newark, NJ (EZA)	04R	4/97
Syracuse, NY (SYR)	28	5/97

(Wilcox Systems)
Fort Wayne, IN (HVD)
Chantilly, VA (IAD)
JFK, NY (JFK)
Stewart, NY (SWF)

...Remainder To Be Specified...